

Contents

I. Introduction and Summary of Findings	1
II. Discussion of Non-economic Experience Results	3
III. Discussion of Economic Experience Results	6
IV. Tabular Summary of Experience Results	8
Table 1 through 9 – Mortality Experience	
Table 10 through 12 – Disability Experience	
Table 13 through 15 – Turnover Experience	
Table 16 through 18 – Retirement Experience	
V. Recommended Actuarial Assumptions.....	28
VI. Graphs of Actual, Expected and Recommended Rates.....	35

I. Introduction and Summary of Findings

Introduction

This Actuarial Experience Study for the City of Philadelphia Municipal Retirement System covers the five years from July 1, 1992 through June 30, 1997. The study contains information for setting actuarial assumptions to use in your July 1, 1997 and future actuarial valuations. We've analyzed your System's actuarial experience, compared experience with the expected experience using your current actuarial assumptions, and summarized our findings.

This study is the most recent in a series of experience studies we've done. The previous study covered July 1, 1988 through June 30, 1993. We prepared this report in accordance with the requirements of Act 205 of 1984 which requires the study to cover five years of experience and be performed every four years.

Act 205 requires the actuarial valuation reports to be prepared using actuarial assumptions selected jointly by the actuary and the Board. As actuary to the Retirement Board, our recommendations for the actuarial assumptions to be used in the July 1, 1997 actuarial valuation are in this report.

Summary of Findings

Non-economic assumptions

We reviewed your actuarial experience for this period and compared it with the results of prior studies. We combined the 1967 Plan and Plan 87 experience and analyzed deaths, disabilities, terminations (quits and discharges), and retirements separately, with breakdowns for municipal members and police and fire members.

We recommend a significant decrease in the assumed mortality rates for retired members, a small decrease on average for disabled municipal workers, and a small increase on average for disabled police and fire members.

We reviewed the proportion of service-connected deaths versus those which are ordinary deaths and found no service-connected deaths for the plan years ending 1993 through 1997. This experience is thought to be at least partially due to the fact that it may be more beneficial for survivors to apply for ordinary death benefits plus workers' compensation rather than service-connected death benefits. No change is recommended.

The number of disabilities for municipal members during the period of the study was less than anticipated under the assumption. For police and fire members, actual experience during the period was much less than the expected experience. This decrease in disabilities may be due to strengthening the definition of disability. We

recommend a moderate decrease in Municipal disability rates and a decrease of 50% on average for police and fire.

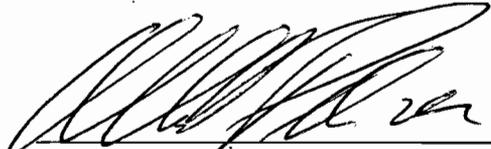
Our analysis of retirement experience shows our assumption is in line except for the first two ages of eligibility. Accordingly, we recommend keeping most of the existing retirement rates while adjusting only the first two years.

Economic assumptions

We do not see a need for changing your 9% investment return assumption at this time.

We believe lowering the rate of salary increase from 5.5% to 5.0% is justified by both previous experience and existing employee contract provisions.

The current assumption for the annual rate of growth in total covered payroll is 5.5%. We believe your experience justifies lowering the payroll growth rate from 5.5% to 5.0%.



Albert Pike 5th, FCA, EA



Kenneth A. Kent, FSA, EA

II. Discussion of Non-economic Experience Results

This section presents the results of the non-economic experience and includes separate analyses for mortality, disability, turnover, and retirement rates.

Data Processing

The demographic data for this study was provided by the City. The data used was the same as that used for the 1993-1997 actuarial valuations.

Annual Rates of Mortality

Active members mortality experience

The mortality experience for active members is summarized in Tables 1 through 3 in Part IV of this report.

The rate of actual deaths for active members is lower than expected. After the 1989 experience study, the assumed rates of active member mortality were increased and have remained the same since. We expect that the number of active member deaths has been under reported. No change in preretirement mortality rates is recommended at this time.

A comparison of the actual percentage of service-connected deaths with the assumptions is as follows:

	Number of Service-Connected Deaths	Percentage of Service-Connected Deaths	
		Expected	Actual
Municipal members	0	2.5%	0.0%
Police and fire members	0	5.0%	0.0%

Although no service-connected deaths were reported, the expected rates are already quite low, having been cut 50% in 1989. We recommend no change at this time. This assumption has a very small impact on overall costs, but is used in determining the difference in the benefit value. The lack of service-connected deaths reported may not be because there were no service-connected deaths, but because survivors choose to apply for ordinary death benefits instead. Service-connected deaths are offset by workers' compensation and therefore may be lower than ordinary death benefits.

The actual, expected and recommended rates are presented in graphs 1 through 3 in Part VI.

Retired member mortality experience

Mortality experience for retired members and surviving spouses is shown in Tables 4 through 6 of Part IV.

The above tables show that actual experience was significantly lower than expected. A consistent overall trend of reduced mortality has occurred among the municipal retirees and police and fire retirees as well as by gender in each group. We recommend an overall rate decrease for all retirees to 95% of the UP-84 Mortality Table (set forward one year for males and set back four years for females). Currently, the City is using 105% for males and females. If future low rates of mortality continue, further adjustments may be necessary.

The actual, expected and recommended rates are presented in graphs 4 through 6 in Part VI.

Disabled Member Mortality Experience

Tables 7 through 9 of Part IV reflect the postretirement mortality experience for disabled members.

Considering the above, we find that the rate of actual mortality among disabled members is lower than anticipated. We recommend lowering these rates to reflect the change in retired member mortality rates.

The annual, expected and recommended rates are presented in graphs 7 through 9 in Part VI.

Annual Rates of Disability

For our analysis of disability experience, see Part IV, Tables 10 through 12.

In addition to looking at the number of disabilities during this period, we examined the proportion of disabilities that are service-connected. No change is currently recommended in the service-connected disability assumption at this time.

The annual, expected and recommended rates are presented in graphs 10 through 12 in Part VI.

Annual Rates of Turnover

The member turnover analysis is summarized in Tables 13 through 15 of Part IV. A summary follows:

The experience for employees is higher than anticipated. To reflect this increase, we recommend revised turnover rates that are smoothed to better reflect experience. A sample of these new rates is below.

Proposed Turnover Rates			
Attained Age	Municipal and Elected Male	Elected Female	Police and Fire
25	0.100818	0.105319	0.022050
30	0.045789	0.071562	0.017159
35	0.038436	0.056170	0.014063
40	0.034679	0.043754	0.010593
45	0.031105	0.035597	0.006913
50	0.028145	0.032000	0.000000
55	0.000000	0.000000	0.000000

The actual, expected and recommended rates are presented in graphs 13 through 15 in Part VI.

Annual Rates of Retirement

The retirement experience is summarized in Tables 16 through 18 of Part IV. The average ages of retirement for the 1967 Plan are:

Actual Average Retirement Age			
Year Ending June 30	Municipal and Elected Male	Elected Female	Police and Fire
1993	59.06	59.90	49.01
1994	59.49	60.01	49.91
1995	59.99	59.72	49.47
1996	59.64	59.83	50.30
1997	59.60	59.79	50.19
Average			

The rates of retirement have been fairly stable over the period of the study.

While the average retirement age is consistent from year to year, the actual incidence of retirement shows that a number of members are retiring when first eligible is greater than expected. To compensate for the trend of earlier retirement, we recommend adjusting the rates for the 1967 Plan for both municipal and police and fire members at selected ages. Plan 87 has not been in place for 10 years – the minimum service required for retirement eligibility; therefore, we did not analyze retirement rates in Plan 87.

The actual, expected and recommended rates are presented in graphs 16 through 18 in Part VI.

III. Discussion of Economic Experience Results

This section presents economic experience for the five-year period July 1, 1992 through June 30, 1997. We analyzed the rate of investment return, the rate of individual salary growth, and the rate of total payroll growth. These economic actuarial assumptions are considered together rather than separately because of their close relationship.

Assumptions reflect a 9% interest rate, a 5.5% salary growth rate, and a 5.5% covered payroll growth rate. Continued use of the 9% investment return assumption is justified by experience; however, the 1993 experience study lowered both the rate of individual salary growth and the rate of covered payroll growth from 6% to 5.5%. Recent experience suggests further revising this 5.5% assumption to 5.0%.

Investment Return

Rates of investment return, after investment expenses, were determined on an actuarial asset valuation basis from year to year. The actuarial asset valuation method uses a five-year average of the investment gain or loss. The five-year average method smoothes the effect of short-term market fluctuations over five years. The actual rates of return on an adjusted market value basis as well as the pure market value basis are:

Year Ending June 30	Rate of Return	
	Adjusted Market Value	Market Value
1993	9.7%	12.8%
1994	7.8	1.6
1995	7.8	11.7
1996	10.5	15.1
1997	12.2	18.3
Average	9.6%	11.9%

The average rate of return during the five-year period is slightly higher than 9% on an adjusted market value basis. The average rates of return for the previous five-year period (1988–1993) were 8.9% on an adjusted market value and 10.0% on a market value basis. We understand that the Board's investment advisors believe 9% is a reasonable expectation for the future. Because the two experience studies support the 9% rate, we recommend continuing the current 9% assumption.

Rate of Salary Increase

The five-year average rate of salary increase is 2.4% for municipal members and 2.3% for police and fire members. The rates summarized by year are:

Average Salary Increase		
Fiscal Year Ending June 30	Municipal and Elected	Police and Fire
1993	6.4%	0.3%
1994	4.1	0.6
1995	8.8	3.3
1996	12.0	8.7
1997	5.2	2.9
Average	2.4%	2.3%

Scheduled increases for the next three years are below the assumed 5.5% rate, even after adjusting for merit and longevity increases. Although experience suggests that the 5.5% salary growth assumption shall be lowered, we believe future experience may be higher than reflected in this five year study.

Accordingly, we recommend a decrease in the individual salary increase assumption to 5.0% for all groups.

Rate of Covered Payroll Growth

In addition to projecting individual salary growth, the assumptions are used to project the annual rate of growth for the total covered payroll. This assumption accounts for growth in covered participants, increases in overtime, and increases in merit and longevity pay. This assumption is necessary because the July 1, 1985 unfunded actuarial accrued liability is funded as a level percentage of covered payroll. During the past five years, the rate of growth in covered payroll averaged 3.2%. This decrease from the expected rate of 5.5% is due to the early retirement window and other decrements. We therefore recommend lowering the covered payroll growth assumption from 5.5% to 5.0%.

IV. Tabular Summary of Experience Results

Table	Divisions by Membership	Description
1	Municipal Active	Mortality: Male
2	Municipal Active	Female
3	Police and Fire Active	Male/Female Combined
4	Municipal Retired	Mortality: Male
5	Municipal Retired	Female
6	Police and Fire Retired	Male/Female Combined
7	Municipal Disabled	Mortality: Male
8	Municipal Disabled	Female
9	Police and Fire Disabled	Male
10	Municipal Active	Disability: Male
11	Municipal Active	Female
12	Police and Fire Active	Male/Female Combined
13	Municipal Active	Turnover: Male
14	Municipal Active	Female
15	Police and Fire Active	Male/Female Combined
16	Municipal Active	Retirement: Male
17	Municipal Active	Female
18	Police and Fire Active	Male/Female Combined

Description of Summary Tables

Expected rate per 1,000

The expected number of decrements (that is, deaths, disabilities, turnovers, or retirements) for every 1,000 members.

Data

We used data from you for members who were continuously active, active members who terminated employment, or inactive members or spouses who left during the five-year period.

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
Results of Experience Study for Fiscal Years 1993 - 1997

Table 1

MUNICIPAL DIVISION ACTIVE MEMBERS
Mortality for Males

Age	Expected Rate Per 1,000	Actual Deaths					Total	Expected Deaths					Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997		
20 - 24	.949	0	0	0	0	1	1	0	0	0	0	0	0	0
25 - 29	.871	0	0	0	0	1	1	1	1	1	1	1	1	5
30 - 34	.995	4	1	0	0	1	6	2	1	1	1	1	1	6
35 - 39	1.443	5	2	0	0	1	8	3	3	3	3	3	3	15
40 - 44	2.273	6	4	1	1	8	20	6	5	5	5	5	5	26
45 - 49	3.728	6	4	2	0	9	21	8	8	9	9	10	9	43
50 - 54	6.064	10	6	2	0	9	27	9	9	9	9	9	11	48
55 - 59	9.547	3	2	7	1	2	15	9	9	9	9	9	8	44
60 - 64	15.085	3	0	4	3	3	13	8	7	7	6	6	6	34
65 - 69	23.765	2	0	1	0	1	4	3	4	4	4	4	3	18
70+	30.134	0	1	1	1	1	4	2	3	2	3	3	3	13
Total		39	20	18	6	37	120	51	50	50	51	50	50	252

Ratio of Actual to Expected Deaths

1993	76%
1994	40
1995	36
1996	12
1997	74
1993-1997	48%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 2

MUNICIPAL DIVISION ACTIVE MEMBERS
 Mortality for Females

Age	Expected Rate Per 1,000	Actual Deaths					Total	Expected Deaths			Total
		1993	1994	1995	1996	1997		1994	1995	1996	
20 - 24	1.049	0	0	0	0	0	0	0	0	0	0
25 - 29	.949	0	0	0	0	0	0	1	1	1	5
30 - 34	.871	0	0	0	0	0	0	1	1	1	5
35 - 39	.995	1	1	0	0	1	3	1	1	1	5
40 - 44	1.443	2	1	0	0	2	5	2	2	2	10
45 - 49	2.273	1	1	0	0	2	4	3	4	4	18
50 - 54	3.728	0	1	2	1	0	4	4	5	5	24
55 - 59	6.064	2	0	1	3	2	8	5	5	5	25
60 - 64	9.547	1	0	2	0	3	6	4	4	4	20
65 - 69	15.085	1	1	0	0	2	4	2	2	3	11
70+	19.878	1	1	0	0	2	4	2	2	2	10
Total		9	6	5	4	14	38	25	26	27	133

Ratio of Actual to Expected Deaths

1993	36%
1994	23
1995	19
1996	14
1997	52
1993-1997	29%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 3

POLICE AND FIRE DIVISION ACTIVE MEMBERS
 Mortality for Males and Females Combined

Age	Expected Rate Per 1,000	Actual Deaths					Total	Expected Deaths			Total	
		1993	1994	1995	1996	1997		1994	1995	1996		1997
20 - 24	.999	0	0	0	0	0	0	0	0	0	0	0
25 - 29	.910	1	0	0	0	2	3	1	1	1	1	5
30 - 34	.933	4	0	0	0	2	6	1	1	1	1	5
35 - 39	1.219	1	0	1	0	1	3	2	2	2	2	10
40 - 44	1.858	4	0	0	0	2	6	4	4	3	3	17
45 - 49	3.001	3	1	2	3	5	14	5	5	5	5	25
50 - 54	4.896	0	1	1	1	3	6	3	4	4	4	18
55 - 59	7.805	1	0	0	0	4	5	1	2	2	2	8
60 - 64	12.316	0	0	0	0	1	1	0	1	1	1	4
65 - 69	19.425	0	0	0	0	0	0	0	0	0	0	0
70+	25.006	0	0	0	0	0	0	0	0	0	0	0
Total		14	2	4	4	20	44	17	18	19	19	92

Ratio of Actual to Expected Deaths

1993	82%
1994	11
1995	21
1996	21
1997	105
1993-1997	48%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 4

MUNICIPAL DIVISION NONACTIVE MEMBERS
 Mortality for Retired Males

Age	Expected Rate Per 1,000	Actual Deaths					Total	Expected Deaths			Total	
		1993	1994	1995	1996	1997		1994	1995	1996		1997
35 - 39	1.894	0	0	0	1	0	1	0	0	0	0	0
40 - 44	2.983	0	0	0	1	1	2	0	0	0	0	0
45 - 49	4.894	0	0	0	0	2	2	0	0	0	0	0
50 - 54	7.960	1	0	0	0	2	3	0	0	0	0	0
55 - 59	12.530	9	13	11	17	14	64	10	10	9	48	48
60 - 64	19.799	22	37	37	23	25	144	29	27	25	132	132
65 - 69	31.191	53	57	53	56	56	275	53	53	53	265	265
70 - 74	47.136	62	65	52	56	62	297	65	66	68	335	335
75 - 79	72.544	57	60	59	61	66	303	66	70	75	356	356
80 - 84	110.028	37	48	52	57	60	254	56	60	64	308	308
85 - 89	164.045	25	37	38	40	42	182	42	44	47	225	225
90 - 94	246.219	10	14	22	19	23	88	17	19	22	105	105
95+	385.825	5	5	8	5	7	30	7	7	6	34	34
Total		281	336	332	336	360	1,645	345	353	361	379	1,808

Ratio of Actual to Expected Deaths

1993	81%
1994	95
1995	92
1996	91
1997	95
1993-1997	91%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 5

MUNICIPAL DIVISION NONACTIVE MEMBERS
 Mortality for Retired Females

Age	Expected Rate Per 1,000	Actual Deaths					Total	Expected Deaths					Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997		
35 - 39	1.306	0	0	0	0	0	0	0	0	0	0	0	0	0
40 - 44	1.894	0	0	0	1	2	3	0	0	0	0	0	0	0
45 - 49	2.983	1	0	0	2	0	3	0	0	0	0	0	0	0
50 - 54	4.894	2	2	1	2	2	9	1	1	1	1	1	1	5
55 - 59	7.960	15	9	8	15	8	55	6	6	6	6	6	6	30
60 - 64	12.530	12	16	12	25	15	80	15	14	14	14	14	14	71
65 - 69	19.799	34	29	35	25	36	159	30	29	29	28	29	29	145
70 - 74	31.191	39	41	35	38	48	201	49	47	47	48	49	49	240
75 - 79	47.136	36	62	55	61	52	266	62	63	65	67	67	67	324
80 - 84	72.544	54	72	69	58	70	323	72	70	71	74	74	78	365
85 - 89	110.028	48	60	71	76	63	318	63	67	69	70	70	71	340
90 - 94	164.045	30	34	37	35	49	185	31	33	39	41	47	47	191
95+	257.184	10	5	12	11	17	55	9	10	12	14	14	16	61
Total		281	330	335	349	362	1,657	338	340	353	363	378	378	1,772

Ratio of Actual to Expected Deaths

1993	83%
1994	97
1995	95
1996	96
1997	96
1993-1997	94%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 6

POLICE AND FIRE DIVISION NONACTIVE MEMBERS
 Mortality for Retired Males and Females

Age	Expected Rate Per 1,000	Actual Deaths					Total	Expected Deaths					Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997		
35 - 39	3.200	0	0	0	0	0	0	0	0	0	0	0	0	0
40 - 44	4.817	0	0	0	2	0	2	0	0	0	0	0	0	0
45 - 49	7.877	5	7	6	8	10	36	3	3	3	3	3	3	15
50 - 54	12.854	13	12	20	17	11	73	11	11	11	11	11	11	55
55 - 59	20.490	10	17	9	16	18	70	15	16	16	17	16	17	82
60 - 64	32.329	11	29	21	27	23	111	23	22	23	24	23	24	116
65 - 69	50.990	33	29	26	27	31	146	28	28	31	32	31	34	154
70 - 74	78.327	38	29	25	28	22	142	33	33	34	35	37	37	172
75 - 79	119.680	48	58	29	40	45	220	60	58	53	52	49	49	272
80 - 84	182.572	56	67	61	49	63	296	63	65	67	69	72	72	336
85 - 89	274.073	49	52	57	58	53	269	53	54	53	54	55	55	269
90 - 94	410.264	26	27	27	35	38	153	28	28	32	35	36	36	159
95+	643.009	8	7	6	7	10	38	9	9	8	10	9	9	45
Total		297	334	287	314	324	1,556	326	328	331	342	348	348	1,625

Ratio of Actual to Expected Deaths

1993	94%
1994	99
1995	78
1996	97
1997	92
1993-1997	92%
1994-1997	92%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 7

MUNICIPAL DIVISION NONACTIVE MEMBERS
 Mortality for Disabled Males

Age	Expected Rate Per 1,000	Actual Disabilities					Total	Expected Disabilities					Total
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997	
35 - 39	13.810	0	0	0	1	0	1	1	1	1	1	0	4
40 - 44	21.748	1	1	1	1	1	5	2	2	2	2	2	10
45 - 49	32.440	4	1	3	3	3	14	5	5	5	6	6	27
50 - 54	33.522	7	6	7	7	3	30	7	8	8	8	8	39
55 - 59	33.491	10	13	8	11	13	55	9	9	8	9	9	44
60 - 64	41.588	13	17	4	8	11	53	12	12	11	11	11	57
65 - 69	55.931	11	13	10	20	15	69	15	15	15	15	14	74
70 - 74	74.135	13	17	8	11	17	66	15	15	15	16	16	77
75 - 79	105.770	1	13	7	3	9	33	10	11	12	12	14	59
80 - 84	160.420	2	8	4	9	11	34	7	8	10	10	11	46
85 - 89	239.179	0	2	1	0	1	4	1	1	2	3	4	11
90 - 94	358.987	0	0	2	0	0	2	1	1	1	1	1	5
95+	562.533	0	0	0	1	0	1	0	1	1	1	0	3
Total		62	91	55	75	84	367	85	89	91	95	96	456

Ratio of Actual to Expected Disabilities

1993	73%
1994	102
1995	60
1996	79
1997	88
1993-1997	80%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 8

MUNICIPAL DIVISION NONACTIVE MEMBERS
 Mortality for Disabled Females

Age	Expected Rate Per 1,000	Actual Disabilities					Total	Expected Disabilities					Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997		
35 - 39	12.161	0	0	0	1	0	1	0	0	0	0	0	0	0
40 - 44	17.646	0	0	0	0	0	0	0	0	0	0	0	0	0
45 - 49	25.280	0	2	1	2	1	6	1	1	1	1	1	1	5
50 - 54	26.307	4	2	2	0	2	10	2	2	2	2	2	2	10
55 - 59	27.167	3	1	3	2	1	10	2	2	2	3	3	3	13
60 - 64	33.638	2	4	1	3	5	15	3	3	3	3	3	3	15
65 - 69	45.349	6	2	3	6	3	20	4	4	4	3	3	3	17
70 - 74	62.691	3	0	1	6	6	16	4	4	5	5	5	5	23
75 - 79	87.815	0	0	1	2	0	3	3	3	4	4	4	4	18
80 - 84	135.150	1	1	2	1	4	9	2	3	3	3	3	3	14
85 - 89	204.981	1	0	0	1	0	2	1	1	1	1	1	1	5
90 - 94	305.617	1	1	0	2	1	5	1	1	1	2	2	2	7
95+	479.134	0	0	1	0	0	1	0	0	0	0	0	0	0
Total		21	13	15	26	23	98	23	24	26	27	27	27	127

Ratio of Actual to Expected Disabilities

1993	91%
1994	54
1995	58
1996	96
1997	85
1993-1997	77%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 9

POLICE AND FIRE DIVISION NONACTIVE MEMBERS
 Mortality for Disabled Males and Females

Age	Expected Rate Per 1,000	Actual Disabilities					Total	Expected Disabilities					Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997		
35 - 39	9.619	0	3	3	0	0	6	0	0	0	0	0	0	0
40 - 44	14.591	3	4	5	4	1	17	2	2	2	2	1	1	9
45 - 49	21.377	5	4	3	6	0	17	7	6	6	5	5	5	29
50 - 54	22.158	4	6	9	9	4	32	6	7	7	7	7	7	34
55 - 59	24.027	8	10	5	5	4	32	5	5	5	5	6	6	26
60 - 64	35.562	6	14	8	12	8	48	8	8	8	8	7	7	39
65 - 69	56.089	9	15	11	15	15	66	12	12	12	12	12	12	60
70 - 74	86.160	5	12	9	17	8	51	10	10	11	13	14	14	58
75 - 79	131.649	4	6	5	13	7	35	9	10	10	11	11	11	51
80 - 84	200.829	1	4	2	8	5	20	5	6	7	8	9	9	35
85 - 89	301.480	1	2	4	4	2	13	2	3	4	4	4	4	17
90 - 94	451.290	0	0	0	1	0	1	0	0	1	1	1	1	3
95+	707.310	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		46	80	64	94	55	339	66	69	73	76	77	77	361

Ratio of Actual to Expected Disabilities

1993	70%
1994	116
1995	88
1996	124
1997	71
1993-1997	94%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 10

MUNICIPAL DIVISION ACTIVE MEMBERS
 Disability for Males

Age	Expected Rate Per 1,000	Actual Disabilities					Total	Expected Disabilities					Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997		
20 - 24	.012	0	0	0	0	0	0	0	0	0	0	0	0	0
25 - 29	.086	3	0	0	0	1	4	0	0	0	0	0	0	0
30 - 34	.539	6	1	0	2	0	9	1	1	1	1	1	1	5
35 - 39	1.477	10	1	2	4	2	19	3	3	3	3	3	3	15
40 - 44	3.287	9	7	8	4	9	37	8	8	7	7	7	7	37
45 - 49	6.758	7	12	13	16	17	65	14	15	16	17	17	17	79
50 - 54	11.287	14	30	29	27	18	118	17	18	18	18	18	20	91
55 - 59	13.282	4	1	7	3	2	17	13	13	12	12	12	12	62
60 - 64	13.500	1	2	5	4	1	13	7	7	6	6	6	6	32
65 - 69	.000	0	0	0	0	0	0	0	0	0	0	0	0	0
70+	.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		54	54	64	60	50	282	63	65	63	64	66	66	321

Ratio of Actual to Expected Disabilities

1993	86%
1994	83
1995	102
1996	94
1997	76
1993-1997	88%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 11

MUNICIPAL DIVISION ACTIVE MEMBERS
 Disability for Females

Age	Expected Rate Per 1,000	Actual Disabilities					Total	Expected Disabilities					Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997		
20 - 24	.017	0	0	0	0	0	0	0	0	0	0	0	0	0
25 - 29	.082	0	0	0	0	0	0	0	0	0	0	0	0	0
30 - 34	.283	1	0	0	0	1	2	0	0	0	0	0	0	0
35 - 39	.686	1	2	2	2	0	7	1	1	1	1	1	1	5
40 - 44	1.607	1	1	3	1	3	9	3	3	3	3	3	3	15
45 - 49	3.648	3	3	2	2	4	10	5	6	6	6	6	6	29
50 - 54	7.112	1	5	9	6	4	25	9	9	9	9	9	9	46
55 - 59	8.808	0	0	0	1	0	1	7	7	7	7	7	7	35
60 - 64	9.000	0	0	1	0	0	1	4	4	4	4	4	4	20
65 - 69	.000	0	0	0	0	1	1	0	0	0	0	0	0	0
70+	.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		7	11	17	12	9	56	29	30	30	30	31	31	150

Ratio of Actual to Expected Disabilities

1993	24%
1994	37
1995	57
1996	40
1997	29
1993-1997	37%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
Results of Experience Study for Fiscal Years 1993 - 1997

Table 12

POLICE AND FIRE DIVISION ACTIVE MEMBERS
Disability for Males and Females Combined

Age	Expected Rate Per 1,000	Actual Disabilities					Total	Expected Disabilities					Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996	1997		
20 - 24	.831	0	0	0	0	0	0	0	0	0	0	0	0	0
25 - 29	1.203	0	0	0	0	2	2	1	1	1	1	1	1	5
30 - 34	2.425	2	0	1	1	1	5	3	3	3	3	3	3	15
35 - 39	4.802	7	2	2	3	1	15	8	7	7	7	7	7	36
40 - 44	8.918	15	11	9	5	4	44	18	17	16	15	15	15	81
45 - 49	15.097	8	2	3	2	2	17	24	25	26	26	25	25	126
50 - 54	16.000	0	1	2	3	0	6	10	11	12	12	12	14	59
55 - 59	16.000	0	1	2	1	2	6	3	3	3	4	4	4	17
60 - 64	16.000	0	0	0	0	0	0	1	1	1	1	1	1	5
65 - 69	.000	0	0	0	0	0	0	0	0	0	0	0	0	0
70+	.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		32	17	19	15	12	95	68	68	69	69	70	70	344

Ratio of Actual to Expected Disabilities

1993	47%
1994	25
1995	28
1996	22
1997	17
1993-1997	28%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 13

MUNICIPAL DIVISION ACTIVE MEMBERS
 Turnover for Males

Age	Expected Rate Per 1,000	Actual Turnovers					Total	Expected Turnovers				Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996		1997
20 - 24	130.181	13	16	15	32	23	99	29	29	29	32	29	145
25 - 29	91.822	63	51	83	69	49	315	77	72	74	72	70	365
30 - 34	53.483	61	88	102	84	70	405	84	77	74	71	65	371
35 - 39	33.577	72	89	127	95	80	463	69	69	69	66	63	336
40 - 44	25.139	57	100	127	80	79	443	62	59	57	55	54	287
45 - 49	20.060	29	75	99	85	71	359	42	46	49	51	50	238
50 - 54	16.026	20	57	.61	39	51	228	24	25	26	26	29	130
Total		315	476	614	484	423	2,312	387	374	378	373	360	1,872

Ratio of Actual to Expected Disabilities

1993	81%
1994	127
1995	162
1996	130
1997	118
1993-1997	124%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 14

MUNICIPAL DIVISION ACTIVE MEMBERS
 Turnover for Females

Age	Expected Rate Per 1,000	Actual Turnovers					Total	Expected Turnovers				Total	
		1993	1994	1995	1996	1997		1993	1994	1995	1996		1997
20 - 24	125.610	13	17	17	21	24	92	27	30	30	30	28	144
25 - 29	106.091	39	67	63	76	72	317	80	81	89	89	91	425
30 - 34	75.790	55	103	70	80	74	382	90	89	90	90	91	454
35 - 39	51.734	67	95	90	74	65	391	80	81	80	80	78	398
40 - 44	39.190	32	89	103	68	62	354	66	66	66	66	66	329
45 - 49	31.552	26	81	86	46	59	298	50	51	54	54	56	259
50 - 54	25.340	16	48	63	31	28	186	33	33	33	34	36	167
Total		248	500	492	396	384	2,020	425	431	443	443	446	2,176

Ratio of Actual to Expected Disabilities

1993	58%
1994	118
1995	114
1996	89
1997	86
1993-1997	93%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 15

POLICE AND FIRE DIVISION ACTIVE MEMBERS
 Turnover for Males and Females Combined

Age	Expected Rate Per 1,000	Actual Turnovers					Expected Turnovers					Total
		1993	1994	1995	1996	1997	Total	1993	1994	1995	1996	
20 - 24	28.952	6	8	3	5	9	31	10	8	9	12	49
25 - 29	27.234	10	24	26	28	25	113	25	27	31	34	145
30 - 34	19.312	13	24	23	29	28	117	24	25	26	27	127
35 - 39	11.013	6	12	25	29	26	98	18	17	17	16	84
40 - 44	6.723	3	26	21	21	22	93	14	12	12	11	62
45 - 49	4.934	0	20	13	6	5	44	8	9	9	8	42
50 - 54	.000	0	4	3	4	2	13	0	0	0	0	0
Total		38	118	114	122	117	509	99	100	99	103	509

Ratio of Actual to Expected Disabilities

1993	38%
1994	118
1995	115
1996	118
1997	108
1993-1997	100%

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 16

MUNICIPAL DIVISION ACTIVE MEMBERS
 Retirement for Males

Age	Rate Per 1,000	Actual Retirements	Expected Retirements	Ratio of Actual to Expected Retirement
55	237	435	341	128%
56	84	137	90	152%
57	84	105	78	135%
58	70	74	59	125%
59	77	78	59	132%
60	77	72	53	136%
61	91	96	55	175%
62	210	129	108	119%
63	126	79	49	161%
64	147	66	50	132%
65	224	93	65	143%
66	140	39	29	134%
67	175	25	27	93%
68	140	21	17	124%
69	140	10	12	83%
70	700	64	316	20%
Total		1,523	1,408	108%

Average Age at Retirement

Period	Actual	Expected
1993	59.06	61.31
1994	59.49	61.62
1995	59.99	61.65
1996	59.64	61.64
1997	59.60	61.74
1993-1997	59.58	61.59

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 18

POLICE AND FIRE DIVISION ACTIVE MEMBERS
 Retirement for Males and Females Combined

Age	Rate Per 1,000	Actual Retirements	Expected Retirements	Ratio of Actual to Expected Retirement
45	200	260	436	60%
46	77	148	152	97%
47	77	113	135	84%
48	84	129	131	98%
49	84	110	113	97%
50	84	105	95	111%
51	87	89	78	114%
52	101	71	75	95%
53	112	64	71	90%
54	112	50	56	89%
55	119	47	46	102%
56	140	40	40	100%
57	140	29	31	94%
58	140	26	23	113%
59	168	22	20	110%
60	168	22	14	157%
61	168	11	11	100%
62	196	8	8	100%
63	196	9	6	150%
64	224	5	5	100%
Total		1,358	1,546	88%

Average Age at Retirement

Period	Actual	Expected
1993	49.01	48.63
1994	49.91	48.83
1995	49.47	49.06
1996	50.30	49.39
1997	50.19	49.66
1993-1997	49.80	49.13

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
 Results of Experience Study for Fiscal Years 1993 - 1997

Table 17

MUNICIPAL DIVISION ACTIVE MEMBERS
 Retirement for Females

Age	Rate Per 1,000	Actual Retirements	Expected Retirements	Ratio of Actual to Expected Retirement
55	187	270	217	124%
56	63	90	54	167%
57	77	64	58	110%
58	77	49	54	91%
59	70	57	44	130%
60	80	41	46	89%
61	80	53	42	126%
62	175	79	79	100%
63	126	47	47	100%
64	126	49	38	129%
65	196	47	49	96%
66	161	24	31	77%
67	161	19	27	70%
68	161	31	23	135%
69	175	17	16	106%
70	700	44	313	14%
Total		981	1,138	86%

Average Age at Retirement

Period	Actual	Expected
1993	59.90	62.81
1994	60.01	62.58
1995	59.72	62.50
1996	59.83	62.54
1997	59.79	62.51
1993-1997	59.84	62.59

V. Recommended Actuarial Assumptions

The recommended actuarial assumptions used in determining cost estimates are described below.

Annual Rate of Withdrawal Prior to Retirement

The assumed annual rates of withdrawal are as follows:

Withdrawal Probabilities at 5-Year Intervals

Attained Age	Municipal and Elected Officials		Uniformed Males and Females
	Males	Females	
20	.100818	.105319	.022050
25	.085911	.096000	.021148
30	.045189	.071562	.017159
35	.038436	.056170	.014063
40	.034679	.043754	.010593
45	.031105	.035597	.006913
50	.028145	.032000	.000000
55	.000000	.000000	.000000

In addition, we assumed that a vested employee terminating employment (with 10 years service) will elect an employee contributions refund unless his or her age plus years of service at termination equal 55 or more (rule of 55). Otherwise, we assumed the person would elect a deferred pension beginning at service retirement age.

Annual Rate of Disability Prior to Retirement

The assumed annual disability rates are as follows:

Disability Probabilities at 5-Year Intervals

Attained Age	Municipal and Elected Officials		Uniformed Males and Females
	Males	Females	
20	.000025	.000043	.000795
25	.000070	.000061	.000870
30	.000557	.000263	.001418
35	.001514	.000620	.002250
40	.003274	.001314	.003321
45	.005485	.002359	.004895
50	.009550	.003571	.006918
55	.000000	.000000	.000000
60	.000000	.000000	.000000
65	.000000	.000000	.000000

In addition, we assumed that 70% of all disabilities among municipal and elected members are ordinary (30% are service-connected) and 50% of all disabilities among uniformed members are ordinary (50% are service-connected).

Annual Rate of Mortality Prior to Retirement

We assumed that deaths of active municipal and elected male members would be at 80% of the UP-84 Mortality Table with ages set forward one year and deaths of municipal and elected female members at 80% of the UP-84 Mortality Table with ages set back four years. In addition, we assumed that 97.5% of all deaths of active municipal and elected members are ordinary (2.5% are service-connected).

We assumed that deaths of active uniformed male members would be at 80% of the UP-84 Mortality Table with ages set forward one year and deaths of uniformed female members would be at 80% of the UP-84 Mortality Table with ages set back four years. In addition, we assumed that 95% of all deaths of active uniformed members are ordinary (5% are service-connected).

Service Retirement

We assumed that active members in the 1967 Plan will retire according to the rates as shown here:

1967 Plan Service Retirement Rates

Age	Municipal and Elected Officials		Uniformed
	Males	Females	Males and Females
45	—	—	.150
46	—	—	.077
47	—	—	.077
48	—	—	.084
49	—	—	.084
50	—	—	.084
51	—	—	.088
52	—	—	.102
53	—	—	.112
54	—	—	.112
55	.270	.226	.119
56	.092	.076	.140
57	.092	.077	.140
58	.077	.077	.140
59	.085	.070	.168
60	.085	.081	.168
61	.100	.081	.168
62	.231	.175	.196
63	.139	.126	.196
64	.162	.126	.224
65	.246	.196	.245
66	.154	.161	.245
67	.193	.161	.245
68	.154	.161	.245
69	.154	.175	.245
70+	1.000	1.000	1.000

The corresponding rates for members under Plan 87 are as follows:

Plan 87 Service Retirement Rates

Age	Municipal and Elected Officials			Uniformed		
	Reduced Benefits	Full Benefits		Reduced Benefits	Full Benefits	
		First Year Eligible ^a	Subsequent Years		First Year Eligible ^a	Subsequent Years
40	--	--	--	.040	.500	.125
41	--	--	--	.040	.500	.125
42	--	--	--	.040	.500	.125
43	--	--	--	.040	.500	.125
44	--	--	--	.040	.500	.125
45	--	--	--	.040	.500	.125
46	--	--	--	.040	.480	.125
47	--	--	--	.040	.460	.125
48	--	--	--	.040	.440	.125
49	--	--	--	.040	.420	.125
50	--	--	--	.040	.400	.125
51	--	--	--	.040	.400	.125
52	.033	.450	.060	.040	.400	.140
53	.033	.420	.060	.040	.400	.150
54	.033	.390	.060	.040	.400	.170
55	.033	.360	.060	.040	.400	.190
56	.033	.330	.060	.040	.400	.215
57	.033	.300	.060	.040	.400	.225
58	.033	.300	.060	.040	.400	.225
59	.033	.300	.080	.040	.400	.230
60	.033	.300	.100	.040	.400	.230
61	.033	.350	.150	.040	.400	.245
62	.033	.430	.300	.040	.400	.295
63	.033	.500	.187	.040	.400	.265
64	.033	.500	.199	.040	.400	.260
65	.033	.600	.309	1.000	.400	1.000
66	.033	.600	.232	--	--	--
67	.033	.600	.214	--	--	--
68	.033	.600	.214	--	--	--
69	.033	.600	.238	--	--	--
70	1.000	.600	1.000	--	--	--

- a. Earlier of age 60 and 10 years of service or 33 years of service for municipal; earlier of age 50 and 10 years of service or 25 years of service for police and fire; and 33 years of service for elected officials.

Annual Rate of Mortality After Retirement

We assumed that postretirement mortality will be 95% of the UP-84 Mortality Table with ages set forward one year for males and 95% of the UP-84 Mortality Table with ages set back four years for females. We assumed that post-disablement mortality will follow the 100% UP-84 Mortality Table (set forward one year for males, set back four years for females) with the adjustment factors in the table below applied at each age for municipal and the adjustment factors in the table on the following page for police and fire.

Post-Disablement Mortality Adjustment Factors (Municipal)

Age	Adjustment Factor		Age	Adjustment Factor	
	Male	Female		Male	Female
47 and earlier	4.86	6.52	62	1.47	1.89
48	4.38	5.85	63	1.41	1.80
49	3.93	5.30	64	1.35	1.75
50	3.60	4.82	65	1.29	1.70
51	3.28	4.30	66	1.24	1.65
52	3.01	3.84	67	1.21	1.58
53	2.75	3.49	68	1.16	1.51
54	2.51	3.20	69	1.11	1.47
55	2.30	2.90	70	1.08	1.42
56	2.10	2.61	71	1.04	1.37
57	1.94	2.34	72	1.00	1.31
58	1.81	2.23	73	1.00	1.28
59	1.71	2.13	74	1.00	1.24
60	1.61	2.05	75	1.00	1.21
61	1.52	1.96	76	1.00	1.17
			77	1.00	1.14
			78	1.00	1.11
			79	1.00	1.08
			80 and later	1.00	1.05

Post-disablement Mortality Adjustment Factors (Uniformed)

Age	Adjustment Factor Unisex	Age	Adjustment Factor Unisex
42 and earlier	3.68	62	1.37
43	3.44	63	1.34
44	3.23	64	1.31
45	3.03	65	1.27
46	2.83	66	1.24
47	2.63	67	1.21
48	2.45	68	1.19
49	2.29	69	1.17
50	2.15	70	1.14
51	2.02	71	1.12
52	1.89	72	1.09
53	1.80	73	1.06
54	1.72	74	1.03
55	1.66	75	1.02
56	1.62	76 and later	1.00
57	1.57		
58	1.53		
59	1.49		
60	1.44		
61	1.41		

Salary Scale

We assumed that salaries, including longevity and overtime, will increase at a compound rate of 5.0% per year.

Rate of Investment Return

We assumed that assets of the fund will accumulate at a compound rate of 9% per year, after annual expenses incurred in the investment of the fund's assets by the equity and debt money managers under contract with the Board of Pensions and Retirement.

Expenses

The administrative expenses of operating the Retirement System are based on the estimated operating budget of the Board of Pensions and Retirement for fiscal year 1997, excluding the fees of the money managers hired to invest the fund's assets.

Value of Investments

Assets held by the fund are valued at market value as reported by the City. The difference between the market value of the assets reported and last year's assets projected forward at the rate of investment return is determined and one-fifth of this difference is recognized immediately and four-fifths is deferred and recognized over the next four years, one-fifth at a time.

Family Composition

We assumed that 70% of all active members and 60% of all nonactive members will be survived by a spouse and that female (male) spouses are four years younger (older) than members.

Form of Annuity

We assumed that all members will elect Option 4 unless otherwise indicated in the participant's data.

Rate of Covered Payroll Growth

We assumed the annual rate of growth of total covered payroll to be 5.0% per year.

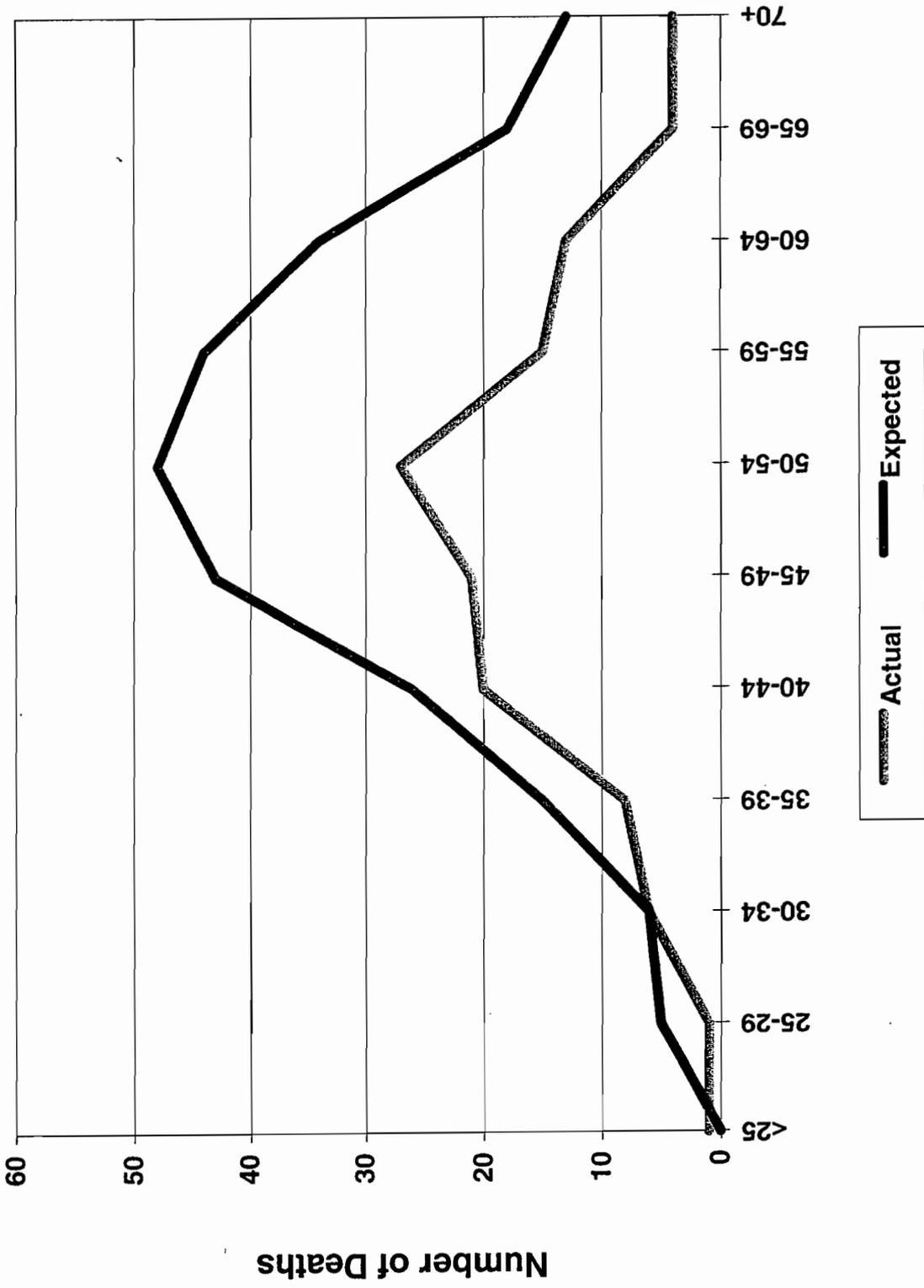
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VI. Graphical Summary of Actual, Expected and Recommended Rates

Graph	Divisions by Membership	Description	
1	Municipal Active	Mortality:	Male
2	Municipal Active		Female
3	Police and Fire Active		Male/Female Combined
4	Municipal Retired	Mortality:	Male
5	Municipal Retired		Female
6	Police and Fire Retired		Male/Female Combined
7	Municipal Disabled	Mortality:	Male
8	Municipal Disabled		Female
9	Police and Fire Disabled		Male
10	Municipal Active	Disability:	Male
11	Municipal Active		Female
12	Police and Fire Active		Male/Female Combined
13	Municipal Active	Turnover:	Male
14	Municipal Active		Female
15	Police and Fire Active		Male/Female Combined
16	Municipal Active	Retirement:	Male
17	Municipal Active		Female
18	Police and Fire Active		Male/Female Combined

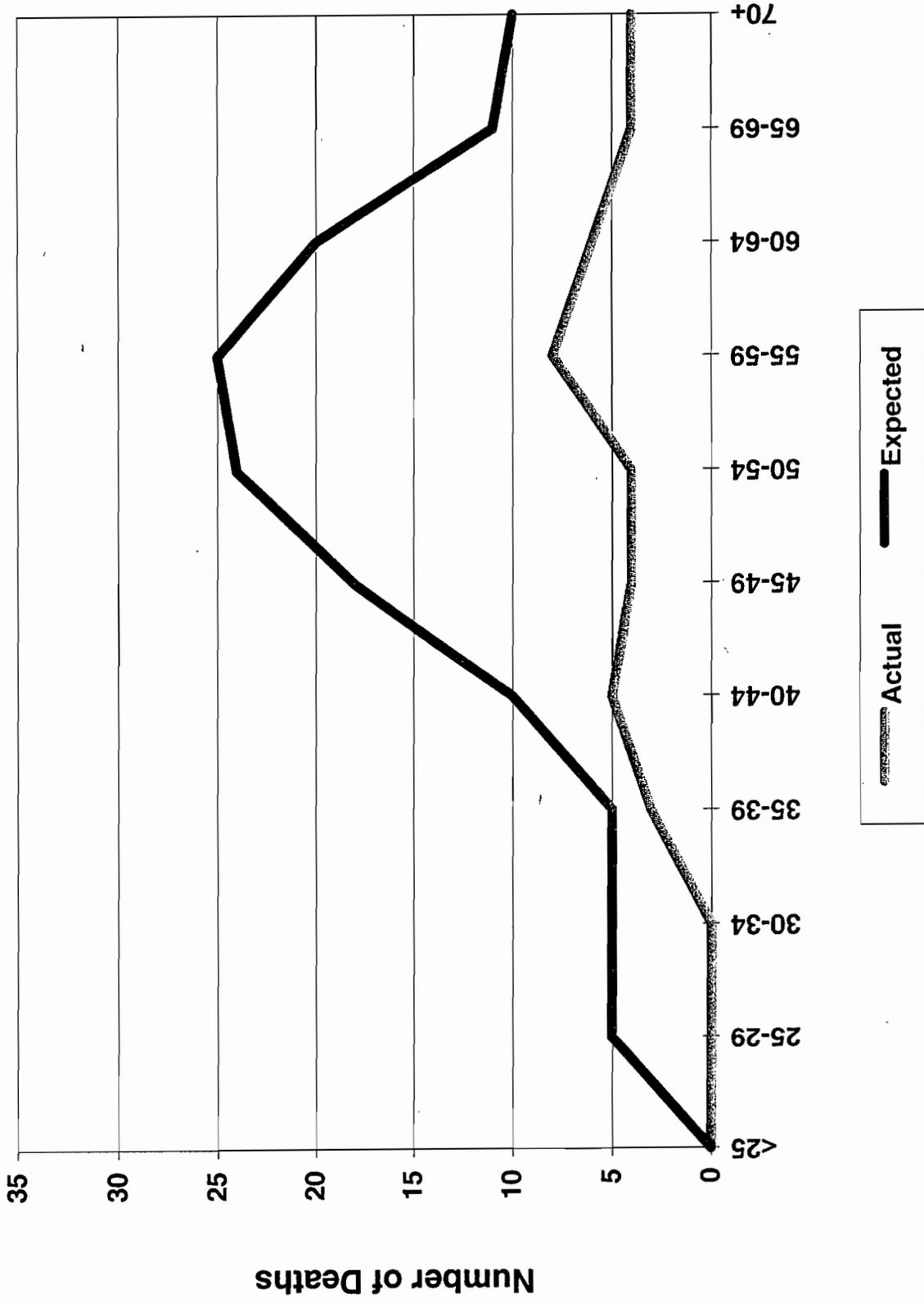
Graph 1

Active Municipal Male Mortality



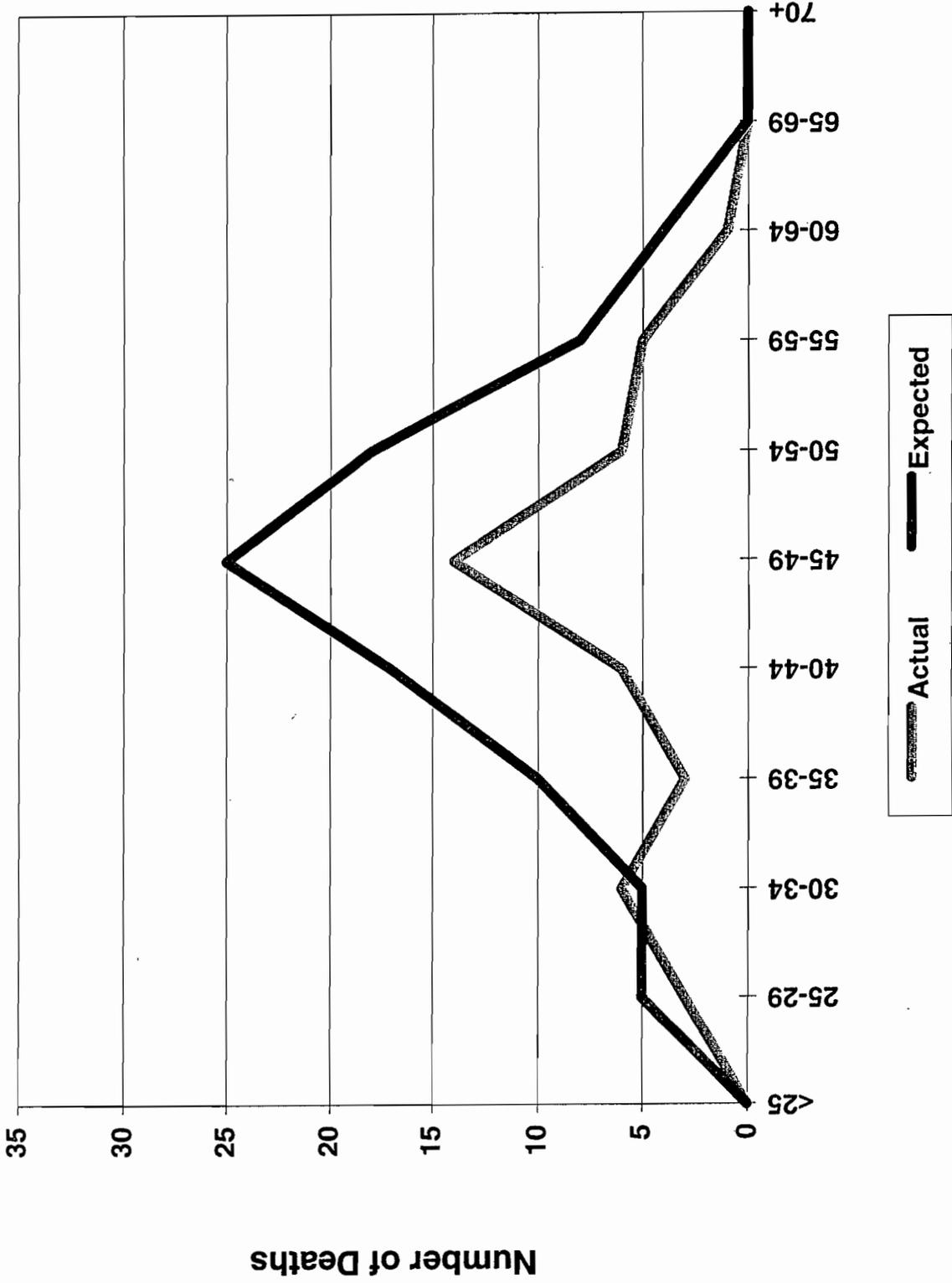
Graph 2

Active Municipal Female Mortality



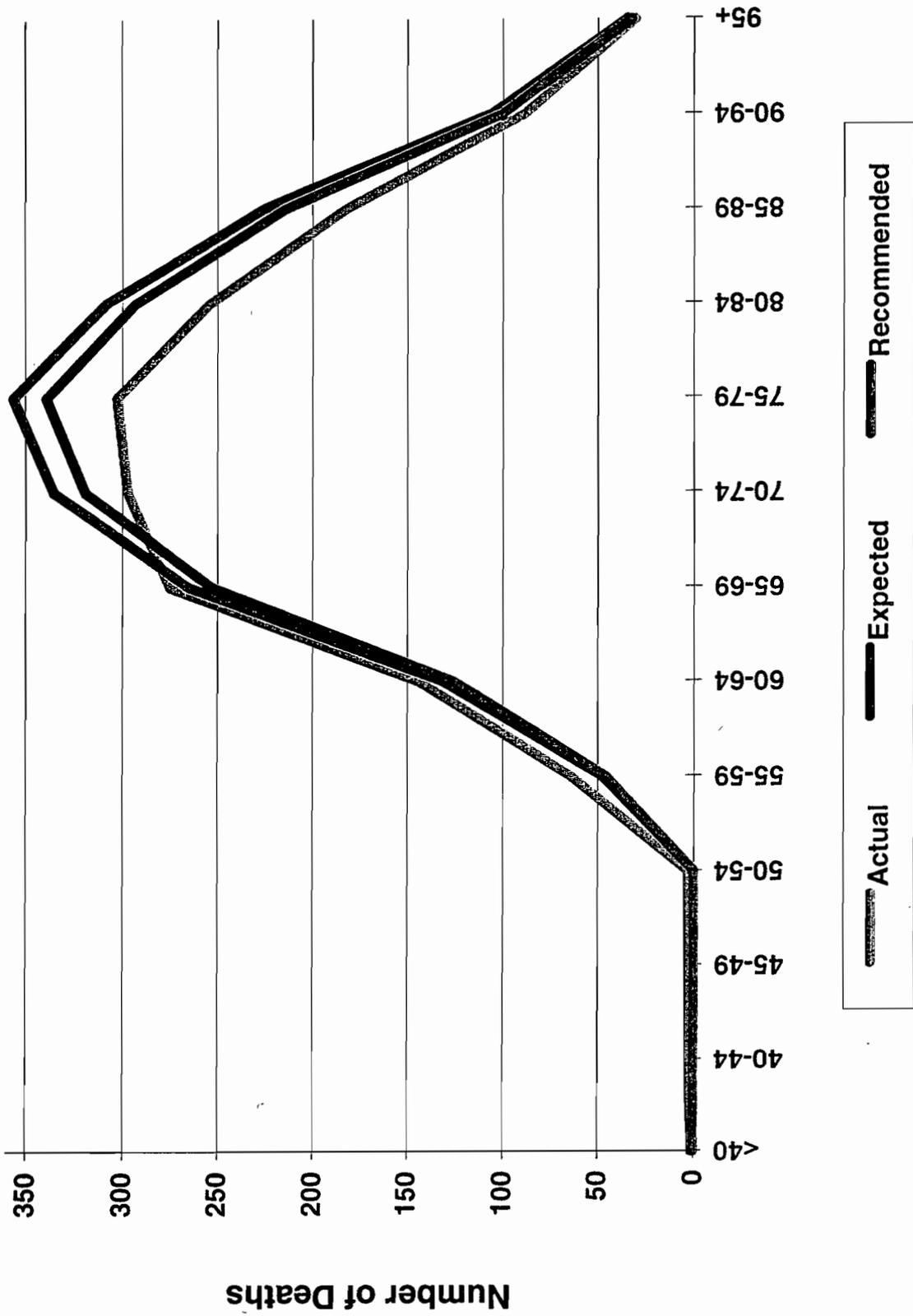
Graph 3

Active Police and Fire Mortality



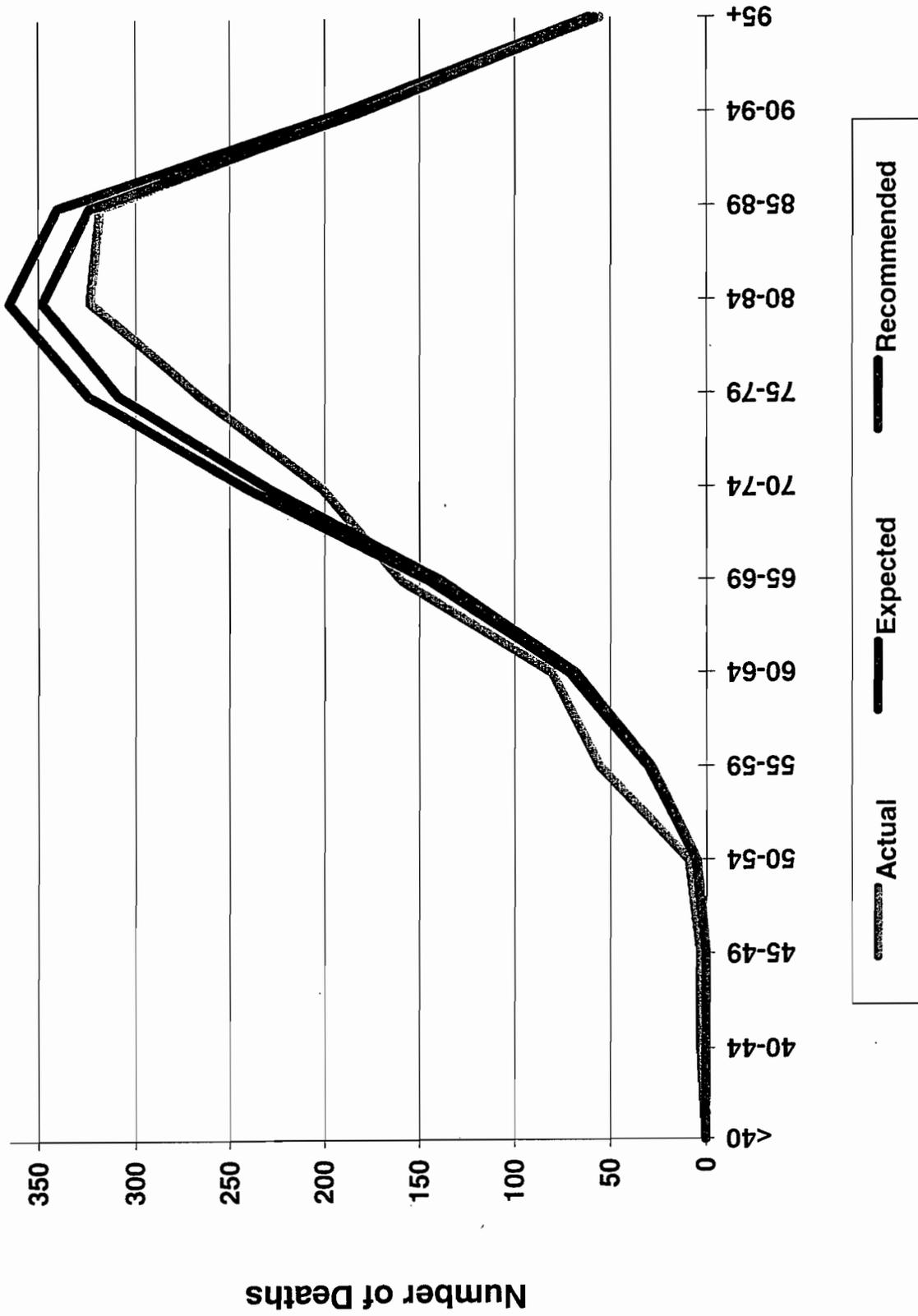
Graph 4

Retired Municipal Male Mortality



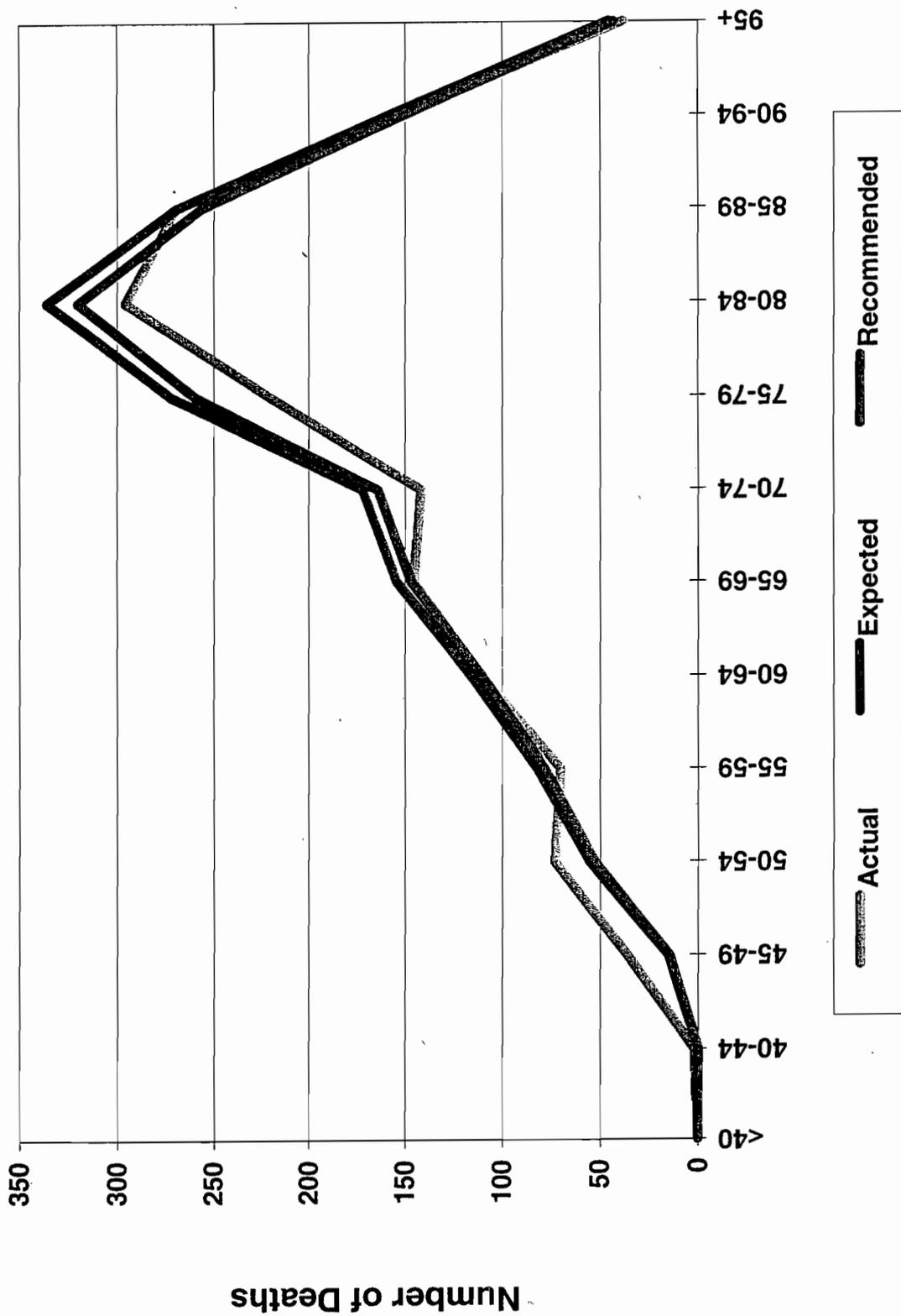
Graph 5

Retired Municipal Female Mortality



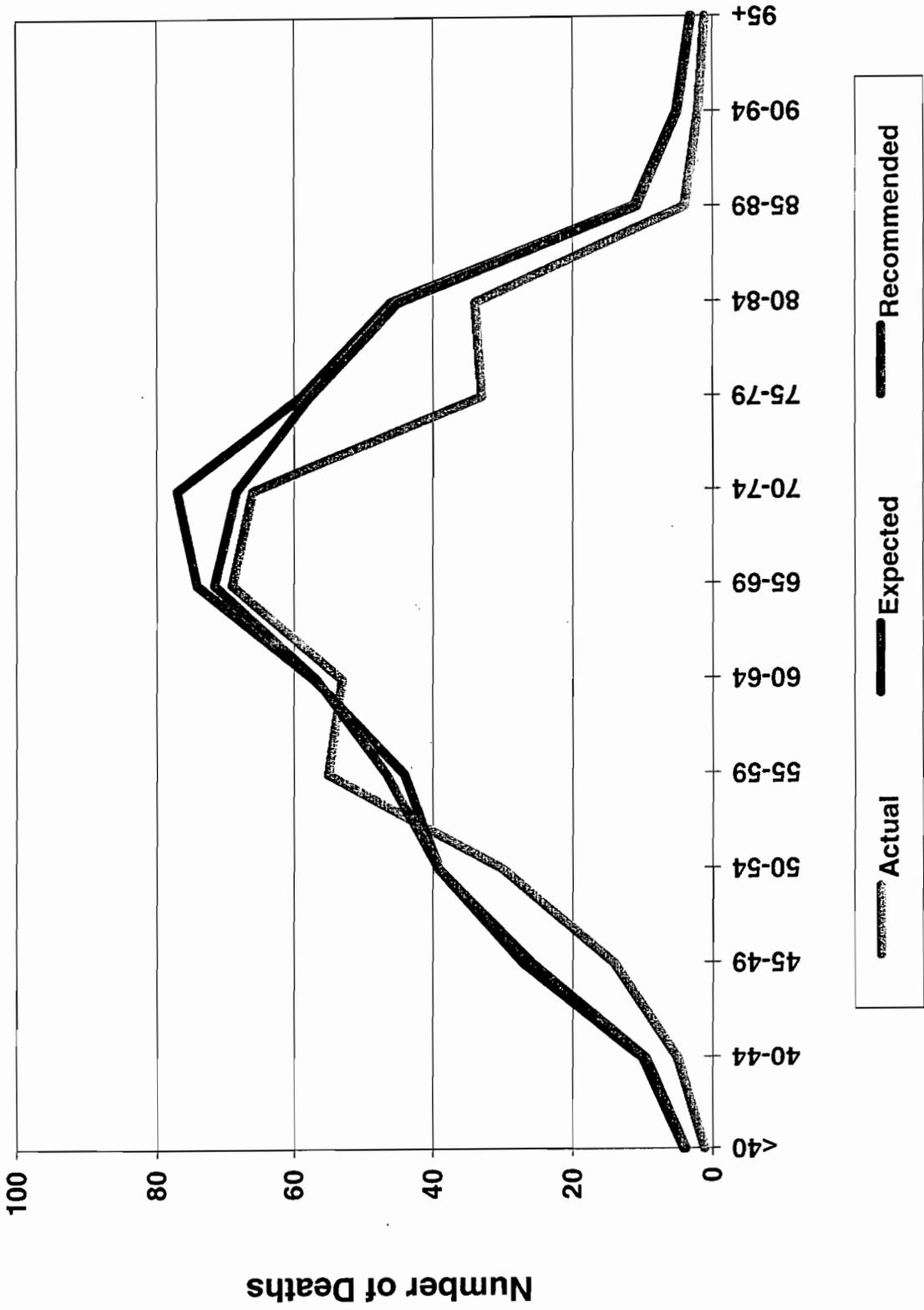
Graph 6

Retired Police and Fire Mortality



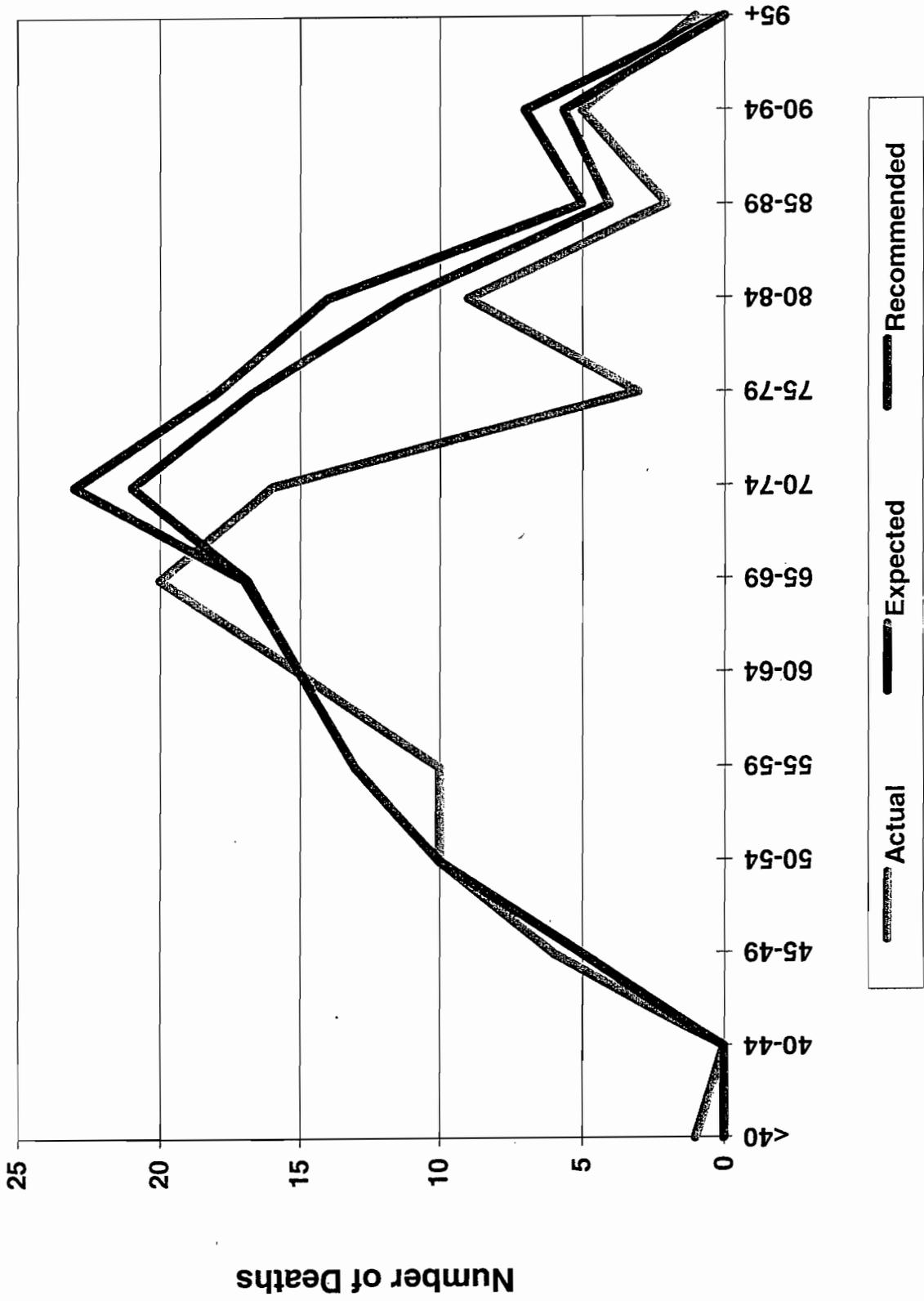
Graph 7

Disabled Municipal Male Mortality



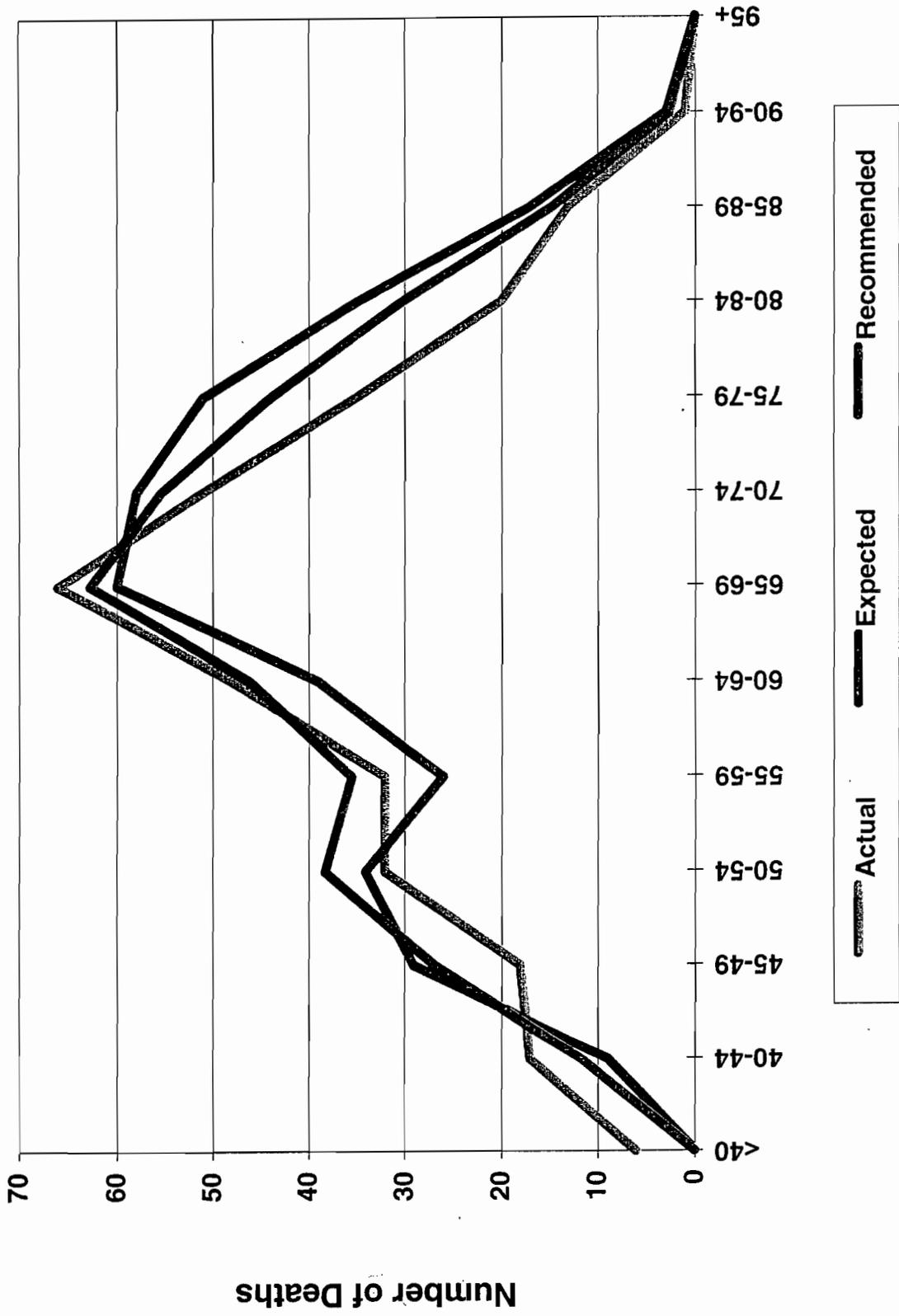
Graph 8

Disabled Municipal Female Mortality



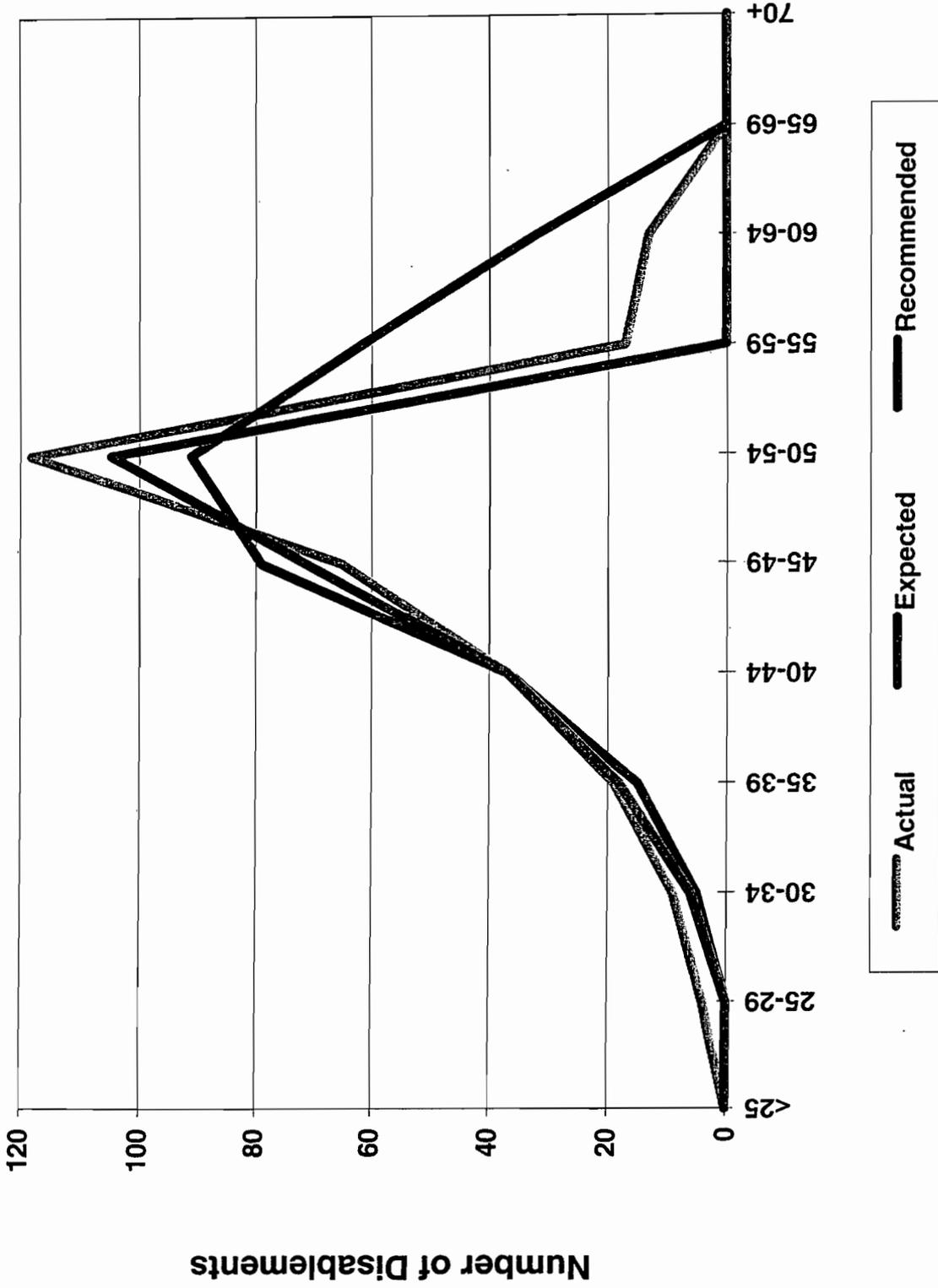
Graph 9

Disabled Police and Fire Mortality



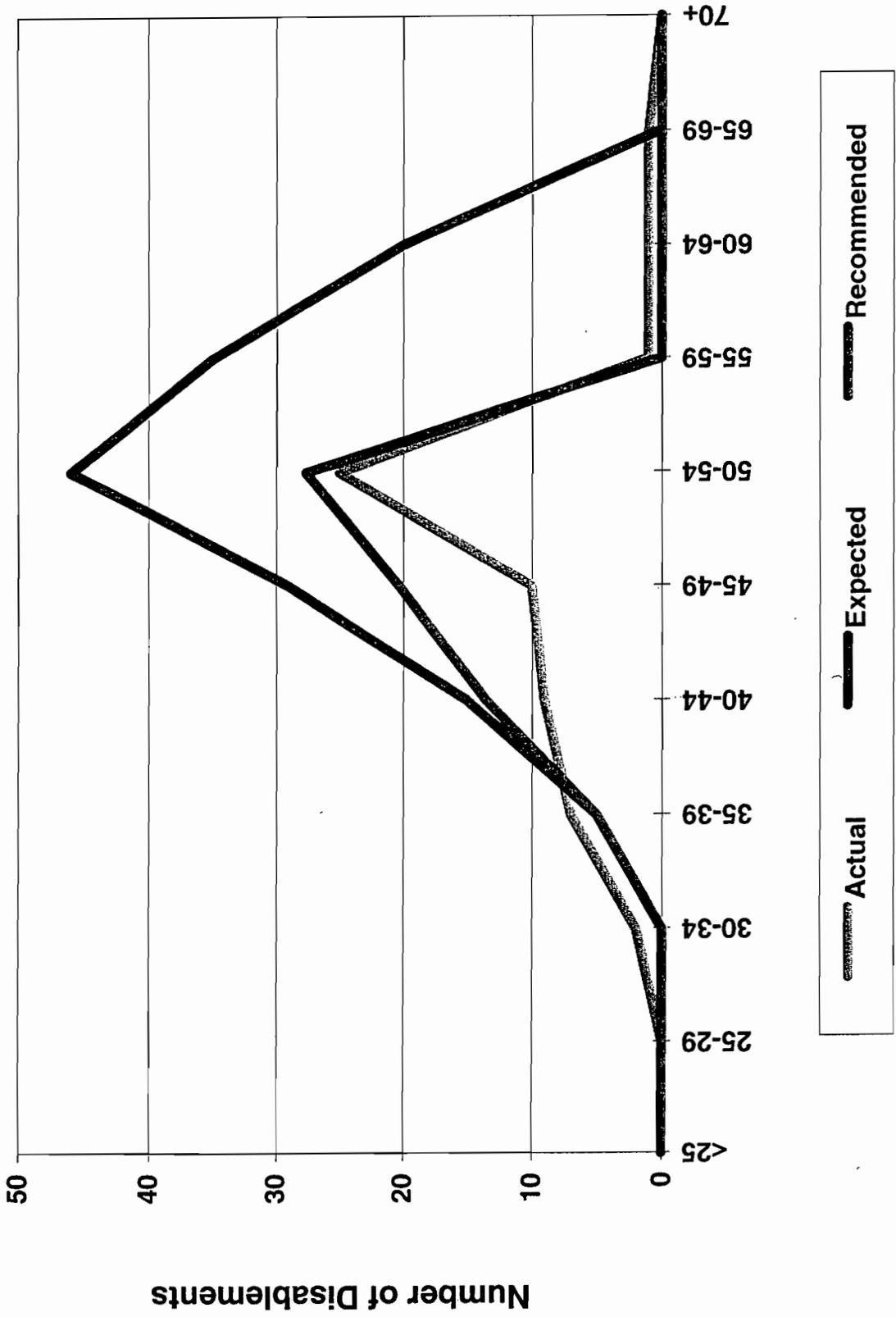
Graph 10

Municipal Male Disability



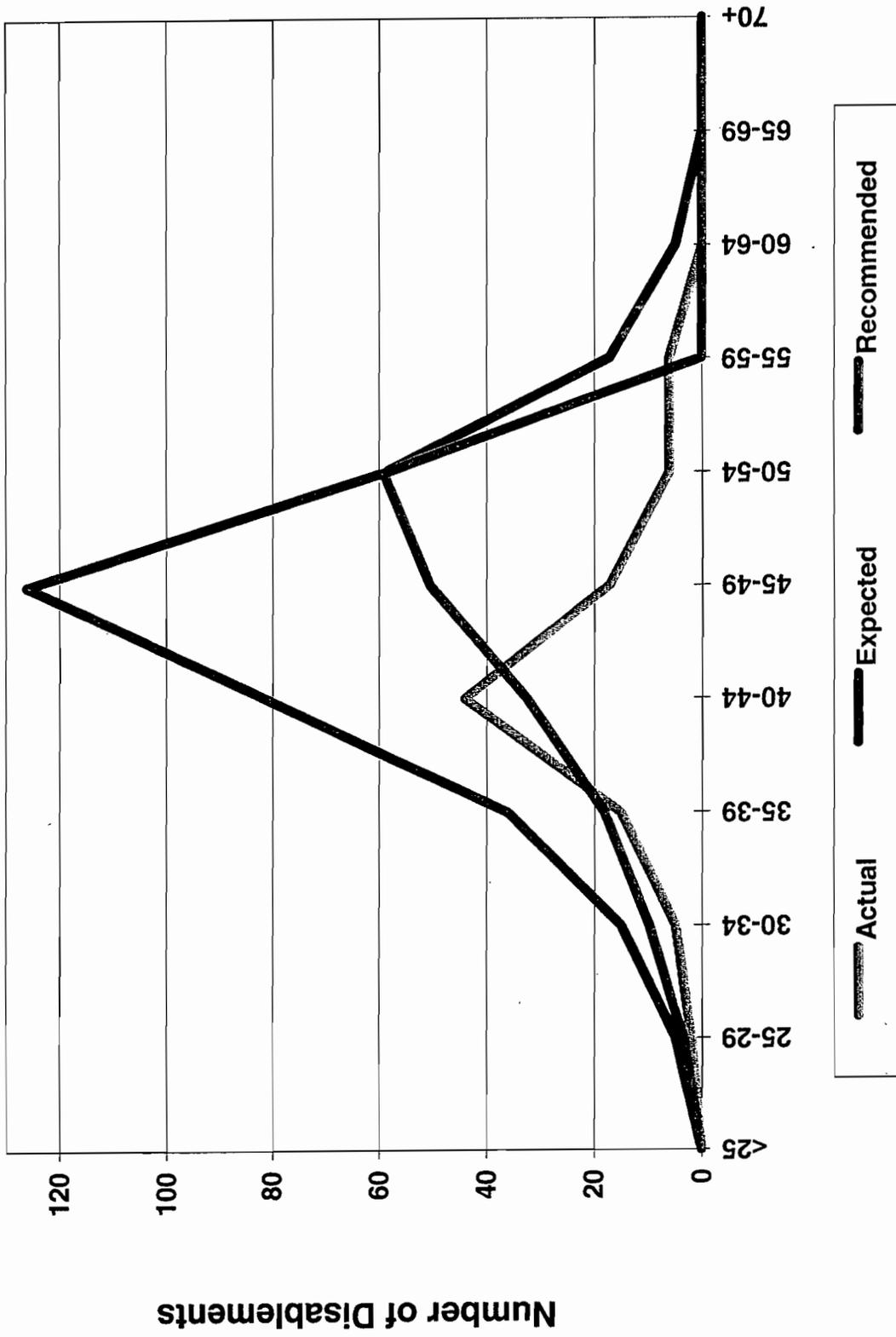
Graph 11

Municipal Female Disability



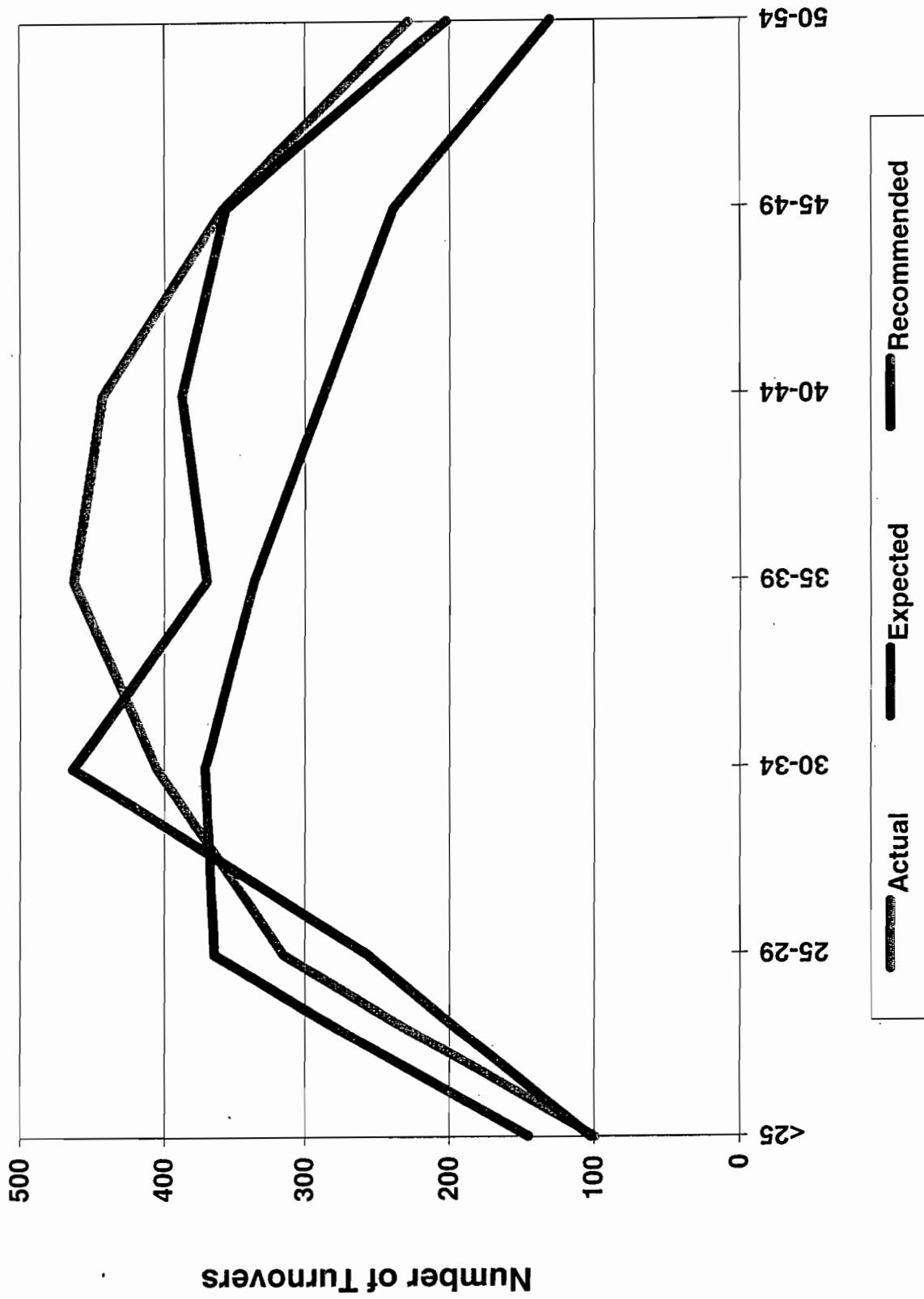
Graph 12

Police and Fire Disability



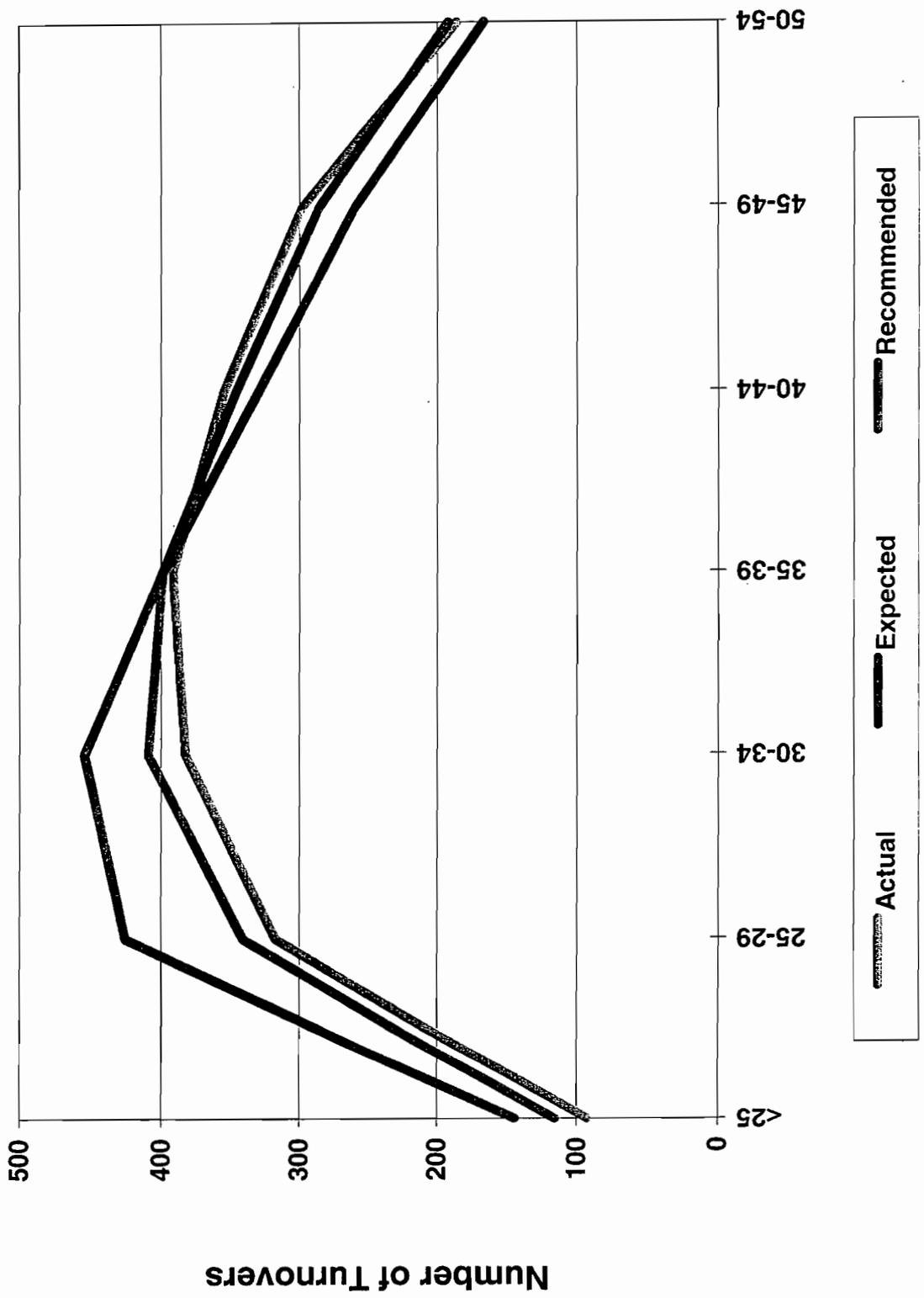
Graph 13

Municipal Male Turnover



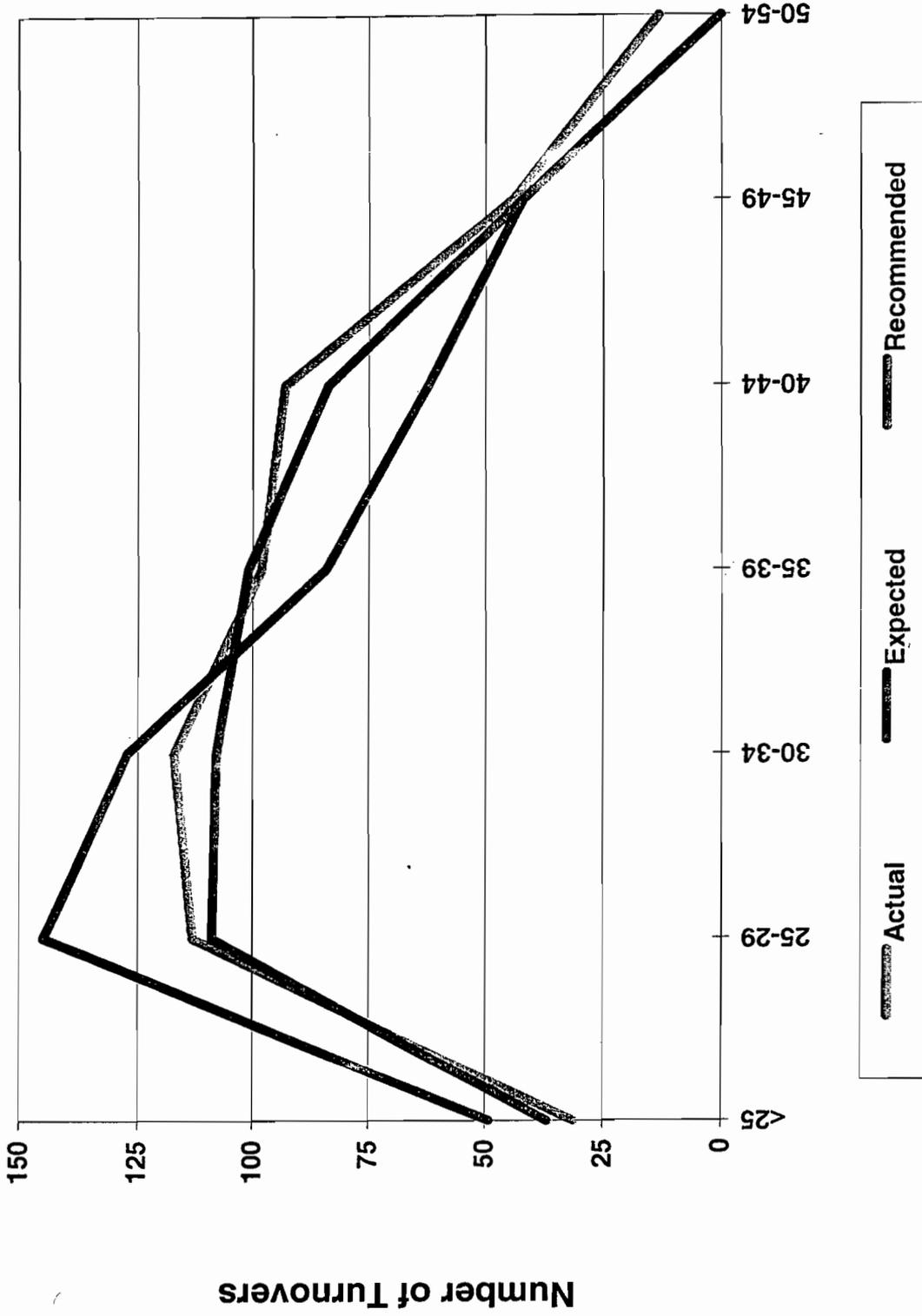
Graph 14

Municipal Female Turnover



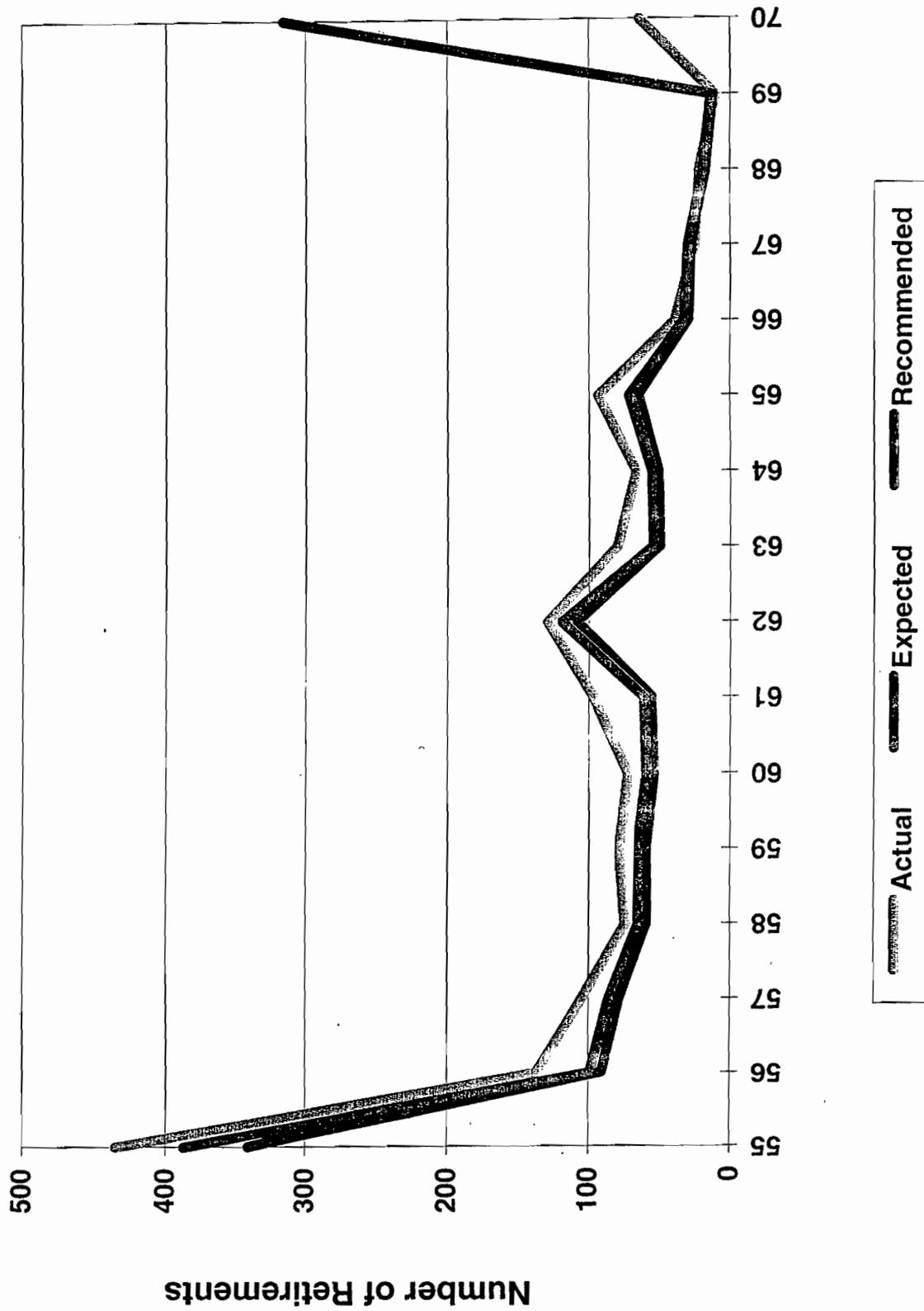
Graph 15

Police and Fire Turnover



Graph 16

Municipal Male Retirement



Graph 17

Municipal Female Retirement

